

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 39

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UNITED STATES PATENT AND TRADEMARK OFFICE

AUG 29 2003

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

PAT. & T.M. OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte FUSEN CHEN, LIANG-YUH CHEN  
and MOSHE EIZENBERG

Appeal No. 2003-1264  
Application No. 08/856,116

ON BRIEF

Before KIMLIN, WARREN and KRATZ, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 15-18, 21 and 23, all the claims remaining in the present application.

Claim 15 is illustrative:

15. A method of filling a feature in a dielectric layer, comprising:

a) depositing a first barrier layer over a blanket dielectric layer;

b) forming a feature through the first barrier layer and the dielectric layer to expose an underlayer;

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c) depositing a second barrier layer on a bottom and sidewalls in the feature;

d) removing the second barrier layer formed at the bottom of the feature; and

e) selectively depositing a metal layer on the underlayer exposed in the feature.

The examiner relies upon the following references as evidence of obviousness:

Taguchi et al. (Taguchi)	5,308,793	May 3, 1994
Sliwa et al. (Sliwa)	4,962,060	Oct. 9, 1990
Zhao et al. (Zhao)	5,674,787	Oct. 7, 1997

Appellants' claimed invention is directed to a method of filling a feature in a dielectric layer comprising the recited steps, including selectively depositing a metal layer on the exposed underlayer.

Appealed claims 15-18, 21 and 23 stand rejected under 35 U.S.C. § 103 as being unpatentable over Taguchi in view of Zhao and Sliwa.

Appellants submit at page 3 of the principal brief that "[p]ending claims 15-18, 21, and 23 do stand or fall together for all arguments presented by Applicant . . . and claim 15 is representative of the claims" (third paragraph). Accordingly, all the appealed claims stand or fall together with claim 15.

We have thoroughly reviewed each of appellants' arguments for patentability. However, we are in full agreement with the

examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the examiner's rejection for essentially those reasons expressed in the Answer.

Appellants have not refuted the examiner's factual determination that Taguchi discloses all the claimed steps, including depositing a metal layer on the exposed underlayer, with the one exception that the metal layer is not deposited selectively (see paragraph bridging pages 3 and 4 of Answer). However, as explained by the examiner, Zhao discloses the selective deposition of copper within the via holes "because it eliminates the polishing (CMP) step, it has a low processing cost and a high quality copper is deposited" (page 4 of Answer, penultimate paragraph). We also note that Zhao teaches that "[t]o replace the tungsten and aluminum plugs with copper plugs in VLSI (or ULSI) manufacturing, another important factor to consider is the process cost" (column 2, lines 31-33). Accordingly, we agree with the examiner that it would have been obvious for one of ordinary skill in the art to deposit aluminum layer 24 of Taguchi in a selective manner, or to substitute

selective copper deposition for the overall aluminum deposition of Taguchi.

Appellants make the argument that "*Taguchi et al.* does not disclose selectively depositing a metal layer on the underlayer exposed in the feature,"<sup>1</sup> and "*Zhao et al.* does not disclose depositing a first barrier layer over a blanket dielectric layer and forming a feature through the first barrier layer and the dielectric layer to expose an underlayer."<sup>2</sup> These statements, however, simply state what is acknowledged by the examiner to be true, but they fail to address the thrust of the examiner's rejection, i.e., the obviousness of employing selective deposition for metal 23 in Taguchi.

We note that appellants present separate arguments for claims 18, 21 and 23 in the Reply Brief. However, as noted above, appellants state in the principal brief that "[p]ending claims 15-18, 21, and 23 do stand or fall together for all arguments presented by Applicant . . . and claim 15 is representative of the claims" (page 3 of principal brief). Accordingly, we have not considered appellants' arguments in their Reply Brief with respect to claims 18, 21 and 23.

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<sup>1</sup> Page 4 of principal brief, third paragraph, last sentence.

<sup>2</sup> Page 5 of principal brief, first paragraph, last sentence.

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As a final point, we note that appellants base no argument upon objective evidence of nonobviousness, such as unexpected results.

In conclusion, based on the foregoing, the examiner's decision rejecting the appealed claims is affirmed.


No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

Edward C. Kimlin  
EDWARD C. KIMLIN  
Administrative Patent Judge

  
CHARLES F. WARREN  
Administrative Patent Judge

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